

Amendment to the Claims:

The listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A communication system for implementing personalizable and customizable features while avoiding feature interactions, comprising:

a tuple space; and

a plurality of user agents representing said features, said user agents communicating with each other via assertions posted to said tuple space in order to implement said features ~~while avoiding feature interactions~~, each of said features being structured as a set of deontic task trees having a parent node with an obliged inherent action and a plurality of child nodes with respective node actions performed according to a predetermined sequence for implementation of each feature, the results of which are reported back to said parent node, said parent node placing deontic modalities on the behavior of said child nodes such that successful implementation of said each feature results from successful occurrence of said inherent action and composed success of the node actions of said children nodes.

Claim 2 (Original): A communication system as claimed in claim 1, wherein said parent node is provided with a sequence operator defining said predetermined sequence.

Claim 3 (Previously Presented): A communication system as claimed in claim 1, wherein said node actions include an ASK action for placing an assertion in said tuple space seeking permission to perform an intended action, waiting a period of time for replies from any other features that subscribe to said assertion, and thereafter either continuing with or discontinuing said intended action based on an internal policy based on said replies.

Claim 4 (Previously Presented): A communication system as claimed in claim 1, wherein said node actions include an atomic STATE action for placing an assertion in said tuple space notifying all subscribing features of an intention to perform an intended action, and thereafter continuing with said intended action.

Claim 5 (Previously Presented): A communication system as claimed in claim 1, wherein said node actions include an ACT action for placing an assertion in said tuple space that performs an action in said communication system.

Claim 6 (Previously Presented): A communication system as claimed in claim 1, wherein said node actions include an OBSERVE action for placing an assertion in said tuple space to monitor events indicating one of either states within said communication system or requests from other agents for its actions.

Claim 7 (Currently Amended): A communication system as claimed in claim 2, wherein said sequence operator is selected from the group consisting of:

[•] PARALLEL - wherein all child nodes are triggered simultaneously and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;

[•] SEQUENCE - wherein said child nodes are triggered in sequence from left to right and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;

[•] FORK - wherein said child nodes are triggered simultaneously and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature;

[•] CHOICE — wherein said child nodes are triggered in sequence from left to right and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature; and

[•] SELECT — wherein each child node becomes associated with a predicate based on the value of a fact in an assertion in said tuple space and only the child node that contains the first predicate deemed true is triggered, and in the event that no child is triggered the parent node assumes a non-occurrence from the child nodes.

Claim 8 (Previously Presented): A communication system as claimed in claim 1, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated

action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 9 (Previously Presented) A communication system as claimed in claim 1, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 10 (Original): In a communication system having a tuple space and a plurality of user agents representing features, said user agents communicating with each other via assertions posted to said tuple space in order to implement said features, each of said features being structured as a set of deontic task trees having a parent node with an obliged inherent action and a plurality of child nodes with respective node actions performed according to a predetermined sequence, the results of which are reported back to said parent node such that successful implementation of said feature results from successful occurrence of said inherent action and composed success of the node actions of said children, the improvement comprising placing permitted deontic modalities on the behavior of at least one of said child nodes so as to avoid spurious feature interactions.

Claim 11 (Canceled)

Claim 12 (Previously Presented): A communication system as claimed in claim 3, wherein said parent node is provided with a sequence operator defining said predetermined sequence.

Claim 13 (Previously Presented): A communication system as claimed in claim 2, wherein said node actions include an ASK action for placing an assertion in said tuple space seeking permission to perform an intended action, waiting a period of time for replies from any other features that subscribe to said assertion, and thereafter either continuing with or discontinuing said intended action based on an internal policy based on said replies.

Claim 14 (Previously Presented): A communication system as claimed in claim 2, wherein said node actions include an atomic STATE action for placing an assertion in said tuple space notifying all subscribing features of an intention to perform an intended action, and thereafter continuing with said intended action.

Claim 15 (Previously Presented): A communication system as claimed in claim 2, wherein said node actions include an ACT action for placing an assertion in said tuple space that performs an action in said communication system.

Claim 16 (Previously Presented): A communication system as claimed in claim 2, wherein said node actions include an OBSERVE action for placing an

assertion in said tuple space to monitor events indicating one of either states within said communication system or requests from other agents for its actions.

Claim 17 (Previously Presented): A communication system as claimed in claim 2, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 18 (Previously Presented): A communication system as claimed in claim 3, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 19 (Previously Presented): A communication system as claimed in claim 4, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 20 (Previously Presented): A communication system as claimed in claim 5, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated

action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 21 (Previously Presented): A communication system as claimed in claim 6, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 22 (Previously Presented): A communication system as claimed in claim 7, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 23 (Previously Presented): A communication system as claimed in claim 2, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 24 (Previously Presented): A communication system as claimed in claimed 3, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 25 (Previously Presented): A communication system as claimed in claimed 4, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 26 (Previously Presented): A communication system as claimed in claimed 5, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 27 (Previously Presented): A communication system as claimed in claimed 6, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 28 (Previously Presented): A communication system as claimed in claimed 7, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 29 (Previously Presented): A communication system as claimed in claimed 8, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 30 (New): A system for implementing features while avoiding feature interactions, comprising:

a tuple space; and

a plurality of agents representing said features, said user agents communicating with each other via assertions posted to said tuple space in order to implement said features, each of said features being structured as a set of deontic task trees having a parent node with an obliged inherent action and a plurality of child nodes with respective node actions performed according to a predetermined sequence for implementation of each feature, the results of which are reported back to said parent node, said parent node placing deontic modalities on the behavior of said child nodes such that successful implementation of each feature results from successful occurrence of said inherent action and composed success of the node actions of said children nodes.

Claim 31 (New): A communication system as claimed in claim 30, wherein said parent node is provided with a sequence operator defining said predetermined sequence.

Claim 32 (New): A communication system as claimed in claim 30, wherein said node actions include an ASK action for placing an assertion in said tuple space seeking permission to perform an intended action, waiting a period of time for replies from any other features that subscribe to said assertion, and thereafter either continuing with or discontinuing said intended action based on an internal policy based on said replies.

Claim 33 (New): A communication system as claimed in claim 30, wherein said node actions include an atomic STATE action for placing an assertion in said tuple space notifying all subscribing features of an intention to perform an intended action, and thereafter continuing with said intended action.

Claim 34 (New): A communication system as claimed in claim 30, wherein said node actions include an ACT action for placing an assertion in said tuple space that performs an action in said communication system.

Claim 35 (New): A communication system as claimed in claim 30, wherein said node actions include an OBSERVE action for placing an assertion in said tuple space to monitor events indicating one of either states within said communication system or requests from other agents for its actions.

Claim 36 (New): A communication system as claimed in claim 31, wherein said sequence operator is selected from the group consisting of:

PARALLEL - wherein all child nodes are triggered simultaneously and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;

SEQUENCE - wherein said child nodes are triggered in sequence from left to right and said parent node waits for a response from each child node before reporting one of either successful implementation or failure of said feature;

FORK - wherein said child nodes are triggered simultaneously and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature;

CHOICE — wherein said child nodes are triggered in sequence from left to right and said parent node waits for a first response from one of said child nodes before reporting one of either successful implementation or failure of said feature;
and

SELECT — wherein each child node becomes associated with a predicate based on the value of a fact in an assertion in said tuple space and only the child node that contains the first predicate deemed true is triggered, and in the

event that no child is triggered the parent node assumes a non-occurrence from the child nodes.

Claim 37 (New): A communication system as claimed in claim 30, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 38 (New) A communication system as claimed in claim 30, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 39 (New): In a system having a tuple space and a plurality of agents representing features, said user agents communicating with each other via assertions posted to said tuple space in order to implement said features, each of said features being structured as a set of deontic task trees having a parent node with an obliged inherent action and a plurality of child nodes with respective node actions performed according to a predetermined sequence, the results of which are

reported back to said parent node such that successful implementation of said feature results from successful occurrence of said inherent action and composed success of the node actions of said children, the improvement comprising placing permitted deontic modalities on the behavior of at least one of said child nodes so as to avoid spurious feature interactions.

Claim 40 (New): A communication system as claimed in claim 32, wherein said parent node is provided with a sequence operator defining said predetermined sequence.

Claim 41 (New): A communication system as claimed in claim 31, wherein said node actions include an ASK action for placing an assertion in said tuple space seeking permission to perform an intended action, waiting a period of time for replies from any other features that subscribe to said assertion, and thereafter either continuing with or discontinuing said intended action based on an internal policy based on said replies.

Claim 42 (New): A communication system as claimed in claim 31, wherein said node actions include an atomic STATE action for placing an assertion in said tuple space notifying all subscribing features of an intention to perform an intended action, and thereafter continuing with said intended action.

Claim 43 (New): A communication system as claimed in claim 31, wherein said node actions include an ACT action for placing an assertion in said tuple space that performs an action in said communication system.

Claim 44 (New): A communication system as claimed in claim 31, wherein said node actions include an OBSERVE action for placing an assertion in said tuple space to monitor events indicating one of either states within said communication system or requests from other agents for its actions.

Claim 45 (New): A communication system as claimed in claim 31, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 46 (New): A communication system as claimed in claim 32, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 47 (New): A communication system as claimed in claim 33, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 48 (New): A communication system as claimed in claim 34, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 49 (New): A communication system as claimed in claim 35, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 50 (New): A communication system as claimed in claim 36, wherein said deontic modalities include Obligated, meaning the associated action must occur in order to be successful; Interdicted, meaning the associated action must not occur to be successful; and Permitted, meaning the associated action need not occur to be successful.

Claim 51 (New): A communication system as claimed in claim 31, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 52 (New): A communication system as claimed in claim 32, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 53 (New): A communication system as claimed in claim 33, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 54 (New): A communication system as claimed in claim 34, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 55 (New): A communication system as claimed in claim 35, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 56 (New): A communication system as claimed in claim 36 wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.

Claim 57 (New): A communication system as claimed in claim 37, wherein said assertions to said tuple space include:

Scope, to name said assertions for subscription by a node;

Fact, to convey information about a user;

Task, to define a goal that a sender action requires a receiver action to perform; and

Modulator, to place a constraint on the execution of the goal that a sender action has sent.